

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>J00041246W0</b>	<b>FOR FURTHER ACTION</b>		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. <b>PCT/GB 99/ 04334</b>	International filing date (day/month/year) <b>21/12/1999</b>	(Earliest) Priority Date (day/month/year) <b>21/12/1998</b>	
Applicant <b>BOWTHORPE INDUSTRIES LIMITED et al.</b>			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

**4. With regard to the title,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

**5. With regard to the abstract,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

**6. The figure of the drawings to be published with the abstract is Figure No.**

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04334

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01C7/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 230 661 A (BOWTHORPE IND LTD) 24 October 1990 (1990-10-24) cited in the application claims 1-12	1-6
A	US 5 444 429 A (SAKICH JOHN D ET AL) 22 August 1995 (1995-08-22) claims 1,6,7	1
A	US 5 317 473 A (LUNDQUIST JAN ET AL) 31 May 1994 (1994-05-31) claims 1-3	1



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

6 March 2000

Date of mailing of the international search report

31/03/2000

Name and mailing address of the ISA

European Patent Office, P.B. 6818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Odgers, M

# INTERNATIONAL SEARCH REPORT

Information on patent family members



International Application No

P GB 99/04334

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2230661	A	24-10-1990	AT 159609 T	15-11-1997
			AU 633868 B	11-02-1993
			AU 4919690 A	16-08-1990
			CA 2009424 A, C	07-08-1990
			DE 69031604 D	27-11-1997
			DE 69031604 T	20-05-1998
			EP 0382447 A	16-08-1990
			ES 2110959 T	01-03-1998
			GR 3025391 T	27-02-1998
			HK 187095 A	22-12-1995
			JP 2271501 A	06-11-1990
			NO 301395 B	20-10-1997
			US 5218508 A	08-06-1993
			ZA 9000899 A	28-11-1990
US 5444429	A	22-08-1995	NONE	
US 5317473	A	31-05-1994	SE 510178 C	26-04-1999
			AU 658917 B	04-05-1995
			AU 2352092 A	18-03-1993
			CA 2078271 A	17-03-1993
			CN 1073034 A, B	09-06-1993
			DE 69207331 D	15-02-1996
			DE 69207331 T	19-09-1996
			EP 0537486 A	21-04-1993
			SE 9102694 A	17-03-1993

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference J00041246WO		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/04334	International filing date (day/month/year) 21/12/1999	Priority date (day/month/year) 21/12/1998	
International Patent Classification (IPC) or national classification and IPC H01C7/12			
Applicant BOWTHORPE INDUSTRIES LIMITED et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"><li>I <input checked="" type="checkbox"/> Basis of the report</li><li>II <input type="checkbox"/> Priority</li><li>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li><li>IV <input type="checkbox"/> Lack of unity of invention</li><li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li><li>VI <input type="checkbox"/> Certain documents cited</li><li>VII <input checked="" type="checkbox"/> Certain defects in the international application</li><li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li></ul>			
Date of submission of the demand 18/07/2000		Date of completion of this report 19.03.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Janhsen, A Telephone No. +49 89 2399 2433 	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04334

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

**Description, pages:**

1-4 as originally filed

**Claims, No.:**

1-6 as originally filed

**Drawings, sheets:**

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04334

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 6.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 6 are so unclear that no meaningful opinion could be formed (*specify*):  
**see separate sheet**

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)

Yes: Claims 1-5

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04334

	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-5
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-5
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/04334

**With respect to item III**

1. No opinion concerning claim 6 could be established in relation to Art. 33 PCT, since the claim is so unclear (see section VIII and Art. 6 PCT), that it is therefore excluded from examination (Art. 34(4) a) ii) PCT).

**With respect to item V**

2. Reference is made to the following document, cited in the search report:

D1: GB 2 230 661 A (Bowthorpe), 24 October 1990, cited in the application

- 3.1 D1 discloses (Fig. 2 + 3) a high voltage surge arrester comprising a plurality of serially connected arrester stages (I-VI), each of which comprises a plurality of electrically matched low voltage surge arresters 1 connected in parallel (page 20, line 20 - page 21, line 2), the low voltage surge arresters 1 of each stage being connected together and to the surge arresters 1 of the or each next adjacent stage by means of a circular mounting plate 22 having corona suspension means 23.
- 3.2 The subject-matter of independent claim 1 differs from the apparatus of D1 in having multiple limbed mounting brackets as connecting means for the surge arresters 1 and between the different stages of surge arresters. The multiple limbed mounting brackets are supplied with corona suppression means at the end of each limb.
- 3.3 The subject-matter of claim 1 solves the technical problem of applying alternative mounting means between the adjoining stages of surge arresters.
- 3.4 The solution, as given by the subject-matter of claim 1, is neither disclosed nor suggested by the available prior art. The remaining A-documents cited in the search report merely disclose the background technology. The subject-matter of claim 1 therefore meets the requirements of Art. 33 (2)-(4) PCT, with proviso of the deficiencies mentioned in section VIII.



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/GB99/04334

- 3.5 Claims 2-5 are dependent claims. Consequently, the subject-matter of claims 2-5 also meets the requirements of Art. 33 (2)-(4) PCT, with proviso of the deficiencies mentioned in section VIII.

**With respect to item VII**

- 4.1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT.
- 4.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

**With respect to item VIII**

5. Claims 1-6 do not fulfill the requirements of Art. 6 PCT.
- 5.1 Claim 6 does not clearly define the matter for which protection is sought (Art. 6 PCT) and does not meet the requirements of Rule 6.2(a) PCT. The statements regarding the description and the drawings do not enable the skilled person to determine the subject-matter of the claims. The scope of the invention becomes obscured especially applying the term "substantially".

Therefore no examination of claim 6 could be carried out.

- 5.2 The statement "spirit and scope of invention", used in the description on page 4, line 17 creates doubt about the matter for which protection is sought, thereby rendering claims 1-6 unclear (Art. 6 PCT).

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
 United States Patent and Trademark  
 Office  
 Box PCT  
 Washington, D.C.20231  
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 21 August 2000 (21.08.00)	
<b>International application No.</b> PCT/GB99/04334	<b>Applicant's or agent's file reference</b> J00041246WO
<b>International filing date (day/month/year)</b> 21 December 1999 (21.12.99)	<b>Priority date (day/month/year)</b> 21 December 1998 (21.12.98)
<b>Applicant</b> DOONE, Rodney, Meredith et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

18 July 2000 (18.07.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Pascal Piriou  Telephone No.: (41-22) 338.83.38
---	---

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 :  
H01C 7/12

A1

(11) International Publication Number: WO 00/38200

(43) International Publication Date: 29 June 2000 (29.06.00)

(21) International Application Number: PCT/GB99/04334

(22) International Filing Date: 21 December 1999 (21.12.99)

(30) Priority Data:  
9828184.3 21 December 1998 (21.12.98) GB

(71) Applicant (for all designated States except US): BOWTHORPE INDUSTRIES LIMITED [GB/GB]; Gatwick Road, Crawley, West Sussex RH10 2RZ (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): DOONE, Rodney, Meredith [GB/GB]; 77B Folders Lane, Burgess Hill, West Sussex RH15 0DE (GB). SHORT, Patrick, George [GB/GB]; 12 The Holt, Burgess Hill, West Sussex RH15 0RF (GB).

(74) Agents: MILHENCH, Howard, L. et al.; R G C Jenkins &amp; Co., 26 Caxton Street, London SW1H 0RJ (GB).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

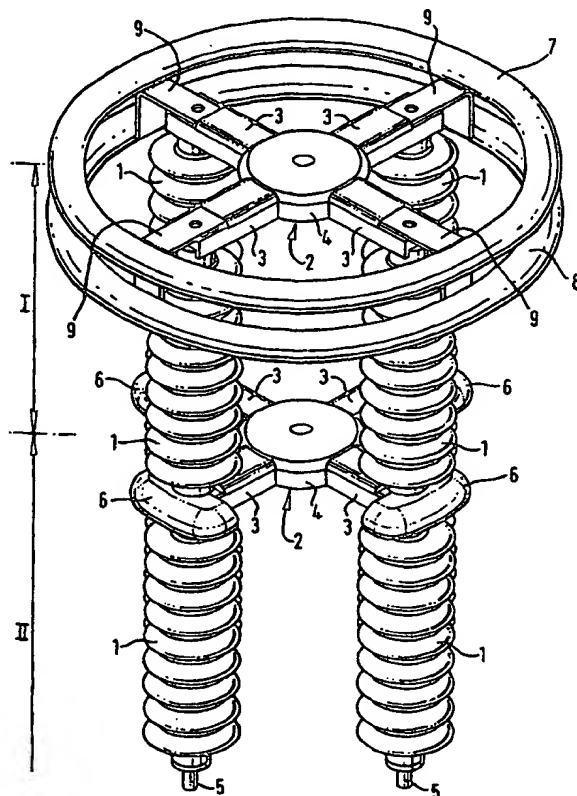
Published

With international search report.

(54) Title: IMPROVEMENTS RELATING TO ELECTRICAL SURGE ARRESTERS

## (57) Abstract

A high voltage (station class) surge arrester comprises a plurality of serially connected stages and each stage comprises a plurality of low voltage (distribution class) polymer housed solid state surge arresters which are electrically matched. The individual surge arresters of each stage are connected together and to the respective surge arresters of the (or each) adjacent stage by means of cast metal mounting brackets (spiders) having plural equiangularly-spaced limbs to the ends of which the surge arresters are attached. Corona suppression rings are mounted at the top end of the arrester and separate corona suppression components are mounted at the ends of the limbs of the intermediate stages.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

Improvements Relating to Electrical Surge Arresters

Field of the Invention:

This invention concerns improvements relating to electric surge  
5 arresters, also known as surge diverters, as used in electrical power generation  
and distribution systems for the safe handling of atmospherically induced  
surges, arising from lightning strikes for example, and over-voltages caused  
by switching operations.

Background of the Invention:

10 We pioneered the introduction of polymer housed solid-state  
distribution class surge arresters, as disclosed in GB-A-2188199 for example,  
and in GB-A-2230661 we proposed the utilization of a series parallel  
arrangement of a plurality of such distribution class surge arresters as a station  
class surge arrester. Distribution class surge arresters generally have voltage  
15 ratings of the order of 24 to 36 kV and by coupling together a plurality of  
electrically matched such distribution class surge arresters in a series parallel  
arrangement as described in GB-A-2230661 much higher voltage ratings of  
the order of 120 to 456 kV can be accommodated.

Our series parallel station class surge arrester is designed to replace the  
20 conventional porcelain housed station class arrester and has been widely  
acclaimed. The present invention concerns improvements in the construction  
of the series parallel arrester.

Summary of the Invention:

Whereas in the series parallel surge arrester described in GB-A-2230661 the individual distribution class surge arresters of adjacent serial stages were offset from each other, the present invention proposes to provide  
5 the arrester units in line throughout the series parallel arrangement. Furthermore, whereas in the surge arrester of GB-A-2230661 metal mounting plates formed integrally with corona suppression rings at their peripheries were utilized for interconnecting adjoining stages of the series parallel arrangement, the present invention proposes a more simple and cost effective  
10 arrangement employing multiple-limbed brackets (spiders) in place of the mounting plates, the distal ends of the limbs being provided with corona discharge inhibiting surfaces.

The above and further features of the present invention are set forth with particularity in the appended claims and will be well understood from  
15 consideration of the following description given with reference to the accompanying drawing.

Description of the Drawing:

The single figure of the accompanying drawing illustrates the upper (top) end of an exemplary series parallel surge arrester according to the  
20 present invention in perspective view.

Detailed Description of the Embodiment:

The series parallel surge arrester shown in the accompanying drawing comprises a plurality of series-connected stages I, II, etc (only the top two of which are shown) each made up of four electrically matched surge arresters 1 which can, for example, be of the kind described in GB-A-2188199 but could be otherwise formed so long as they exhibit sufficient structural integrity. The individual surge arresters 1 in each stage I, II, etc are coupled together and to the adjoining arresters of the next adjacent stage by means of cast metal brackets (spiders) 2 having a plurality of limbs 3 extending from a central body portion 4 with even angular spacing of 90°. As can be seen, the individual surge arresters 1 of the different stages are aligned with each other.

The individual surge arresters 1 have externally screw-threaded end fixing studs 5 which enable the surge arresters to be affixed to the ends of the limbs 3 of the brackets 2, for example by provision of a double and oppositely screw-threaded locking nut at the end of each limb 3 which can be turned with a spanner so as to pull the opposite ends of the respective two surge arresters together and into mounting engagement with the end of the respective limb.

Mounted at the ends of the limbs 3, after attachment of the surge arresters 1, are cast metal corona suppression bodies 6 which can for example form a push fit onto the ends of the limbs 3 with close conformance around the ends of the two surge arresters 1 that are attached to the respective limb. The surfaces of the bodies 6 are smoothly curved as shown to avoid giving

rise to excessive field voltages such as might give rise to corona discharge effects.

At the top end of the series parallel arrangement, a corona suppression arrangement comprising parallel spaced-apart rings 7 and 8 which are coupled  
5 to the limbs 3 of the uppermost mounting bracket 2 by means of mounting brackets 9.

The illustrated series parallel surge arrester is believed to satisfy electrical requirements and the mounting brackets 2 and their accessories, namely the corona suppression bodies 6 and the arrester fixing nuts (not  
10 shown), can be manufactured at lower cost than the electrostatic mounting plates of the series parallel surge arrester described in GB-A-2230661. Furthermore, by virtue of the in line connection of the surge arresters of adjacent stages, the overall stiffness of the series parallel surge arrester can be increased as compared to that of GB-A-2230661. Otherwise the illustrated  
15 surge arrester obtains all of the advantages that are described in GB-A-2230661. Modifications and variations are of course possible without departure from the spirit and scope of the invention as set forth in the appended claims; for example, the brackets 2 could have more or less limbs than the four limbs shown.



Claims:

1. A high voltage surge arrester comprising a plurality of serially connected arrester stages each of which comprises a plurality of electrically  
5 matched low voltage surge arresters connected in parallel, the low voltage surge arresters of each stage being connected together and to the surge arresters of the or each next adjacent stage by means of a multiple limbed mounting bracket having corona suppression means at the end of each limb.
- 10 2. A high voltage surge arrester as claimed in claim 1 wherein at the top of the surge arrester the corona suppression means comprises at least one corona suppression ring.
- 15 3. A high voltage surge arrester as claimed in claim 1 or 2 wherein the corona suppression means at the ends of the limbs of the or each said mounting bracket supporting the ends of adjacent serial stages of the arrester comprise individual bodies associated each with a respective one of the limbs.
- 20 4. A high voltage surge arrester as claimed in any of the preceding claims which is adapted for station class operation and wherein the low voltage surge arresters are distribution class surge arresters.

5. A high voltage surge arrester as claimed in any of the preceding claims wherein the low voltage surge arresters are polymer housed solid state surge arresters.
- 5 6. A high voltage surge arrester substantially as herein described with reference to the accompanying drawing.

1 / 1

